Index of Chain Drug Store Sales*

THE index of aggregate sales of chain drug stores presented in the accompanying table and chart is based on data supplied by a large and representative sample of firms operating in this field.[1] The index is one of the retail-trade series which the Bureau plans to include in a comprehensive monthly index of total retail trade now in preparation.

The series covering chain drug store sales is presented with and without seasonal adjustment for each month since July 1934, the first month for which these data are available.

The most striking characteristic of the series (see Fig. 6, page 11) is its relative stability as compared with most other lines of retail business. It is also interesting to note that the low and high points in the adjusted index are at the beginning and near the end of the chart. The range is from 91.0 in July 1934 to 107.6 in August of this year.

The upward trend in this index is, of course, primarily indicative of the recovery of business from the depression low of 1932. It is also, however, a reflection of growth of the drug store in the retail field.

It is well known that drug stores, notably chain organizations, have steadily expanded the range and variety of commodities handled and that the relative sale of many of these has mounted in recent years. In particular, there has been a considerable expansion in liquor sales during the period covered by the index in those States where such sales are legally permitted. The results now available from the 1940 Census of Retail Business confirm this trend. The retail drug trade is shown as having made striking advances in both number of stores and volume of sales.

The wide range of items carried by drug stores apparently have offsetting seasonal characteristics since the range of seasonal variation is relatively small. Except for December, when the Christmas season brings about a considerable increase in sales, the seasonal variation ranges from 6½ percent below the average in February to 1½ percent above in October. For example, the sale of cold remedies and similar products are at their peak when other items such as ice cream and cold fountain drinks are at their seasonal low. It is also to be noted that the cyclical variation in this trade is unusually small; from the peak in 1937 to the trough in 1938 the adjusted index declined only 10 percent as compared with an estimated decline of 16 percent in total retail trade.

Source of Data Used in Index.

Monthly releases indicating percentage changes in sales of a sample group of chain drug stores have been published by the Bureau of Foreign and Domestic Commerce since July 1935.[2] This series is one of a group designed to indicate changes in consumer expenditures and also to provide store operators with a standard of comparison for their own operating figures. The sample data showing monthly percent changes in sales now cover a sufficient period of time to warrant the construction of an index series and adjustment of the data for seasonal variation.

When this series was begun two alternative methods of sampling were available. The first was to secure an identical group of reporting firms. The second was to secure a larger and more representative sample for each month's release—but one which would not be identical from month to month. The latter method was decided upon and the subsequent results have been presented in the form of monthly reports showing the percentage relationship of a given month with the previous month and with the same month of the previous year.

Under this method of sampling the number of reporting companies and the number of stores operated have differed in each monthly comparative statement not only because certain companies fail to report in some months, but also because of more or less continuous sample improvement by extending the number of firms. Hence, the dollar values were not comparable from month to month except as reduced to a common base such as average sales per company or average sales per store. This procedure was found to be unsatisfactory for this series of data. Hence, relative comparisons were derived for this index by linking the percentage change data which are available from the changing sample of reporting firms.

Method of Computing Index.

First, some recent month is arbitrarily set as 100 to provide a base point for establishing the relationships. The corresponding month of the preceding year is then expressed as a relative of the base using the year-ago change shown in the report for the base month. Each successive month preceding the selected base month is expressed as a chain relative of the base month using the month-ago percentage shown in each published report. The chain drug store sales data were so related by using May 1940 as the base month. The relative for the thirteenth month in the chain coincided exactly

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[1] At the end of 1935, shortly after collection of these data was initiated, sales of reporting companies were approximately two-thirds of the total chain drug store business as shown by the 1935 Retail Census. By the end of 1939 the reporting group had been expanded to an estimated coverage of about 85 percent.

[2] From the beginning these releases have presented figures by major departments (fountain, tobacco, and "all other") and by geographic regions since January 1937; since May 1937 the percentage distribution of sales by departments has been shown in each month's release. The data in these releases are on an average daily sales basis and are not to be confused with changes shown by the index presented here which has been computed from aggregate sales figures for the calendar month.

with the year-ago relative of the base month. Generally such coincidence is not obtained by this process.[1]

From this point each earlier month in turn is computed from the year-ago percentage change shown in the report a year later, and also from the month-ago percentage change shown in the release a month later. Where the two relatives so obtained do not coincide some adjustment must be made. This adjustment may be a simple average of the two relatives or it may be a figure weighted in accordance with specific knowledge concerning the sample, the observable link with the next succeeding month, the relationship with the same month a year later, and similar considerations.

By the process just described the relatives were extended back through July 1934, and also brought up to date to obtain a series for which the chosen starting month was the base. The series was then converted to a 1935-1939 base by dividing through by the average of the relatives for those years.

The ratio to moving average method of adjusting for seasonal fluctuations was used in this chain drug store sales series. The data for certain months gave

[1] The two factors involved are the validity of each month's sample and the stability of the reporting group. If the reporting group is unstable and a close check is secured it would seem to verify the necessary basic assumption that each month's data were representative. This would seem to be a reasonable assumption in the case at hand since the chain drug companies currently contributing figures to the series are estimated to account for well over four-fifths of the total chain drug business. However, the use of revised figures, including late reports, has added greatly to the stability of the over-all sample, and this in turn has aided in obtaining the close correspondence of relatives.

If the two relatives obtained do not coincide the thirteenth figure in the chain can be adjusted to the year-ago relative of the base and each later month corrected in turn by factors successively altered by 1/12 of the original difference; i. e., the thirteenth relative is corrected by 12/12 of the difference, the twelfth relative by 11/12 of the difference, and so on to a correction of zero in the base month. Actually the error for which correction is being made probably has accumulated geometrically rather than arithmetically, but in most cases where the figures warrant the construction of an index by this method the correction is so small as not to warrant the additional calculating steps necessary.

fairly definite evidence that their importance in relation to the year's business was changing. This was especially true of August and December which appeared to be respectively decreasing and increasing in importance. Hence, slight adjustments were made to account for this shifting importance of seasonal levels. The factors used for 1939, the latest complete calendar year covered, are as follows: January, 95.8; February, 93.5; March, 99.5; April, 96.7; May, 97.2; June, 94.5; July, 96.3; August, 96.0; September, 96.0; October, 101.5; November, 98.9; December, 135.1.

Table 1.—Index of Chain Drug Store Sales, 1934-40
[Monthly average 1935-39=100]

	1934	1935	1936	1937	1938	1939	1940
	Without Seasonal Adjustment						
January		91.3	94.0	101.7	95.3	94.8	98.1
February		59.8	97.0	97.8	90.3	92.7	96.5
March		97.2	97.3	104.7	96.6	100.4	102.2
April		93.5	96.8	100.3	96.6	90.8	96.5
May		94.8	96.7	104.7	93.8	97.1	96.7
June		94.2	97.0	96.4	91.0	95.5	98.5
July	88.6	94.1	100.5	103.7	94.1	95.6	99.4
August	93.6	93.3	96.7	96.3	94.8	95.6	102.2
September	90.1	91.4	96.8	100.1	94.2	97.3	95.7
October	94.6	93.2	105.2	104.6	101.5	101.2	
November	91.1	97.3	99.2	97.9	96.8	101.3	
December	119.8	123.9	134.8	131.3	131.6	136.1	
Monthly average	[1] 95.8	96.7	101.3	103.8	96.3	100.0	
	With Seasonal Adjustment						
January		96.3	98.1	106.2	99.5	90.0	101.3
February		96.2	100.2	104.4	97.1	90.1	98.7
March		97.7	97.8	105.2	97.3	90.0	103.7
April		96.7	99.6	103.7	90.8	100.1	99.0
May		96.6	100.6	106.6	96.5	99.9	102.1
June		97.2	101.1	103.5	96.7	101.1	104.8
July	91.0	95.7	102.2	106.0	98.7	90.3	103.8
August	93.0	93.6	101.2	102.3	99.2	99.8	107.0
September	93.0	95.2	100.8	104.3	99.3	101.4	102.8
October	93.1	95.7	103.0	103.8	99.7	99.7	
November	93.1	100.4	102.4	106.5	96.4	102.2	
December	94.8	96.3	104.4	100.5	99.4	101.5	

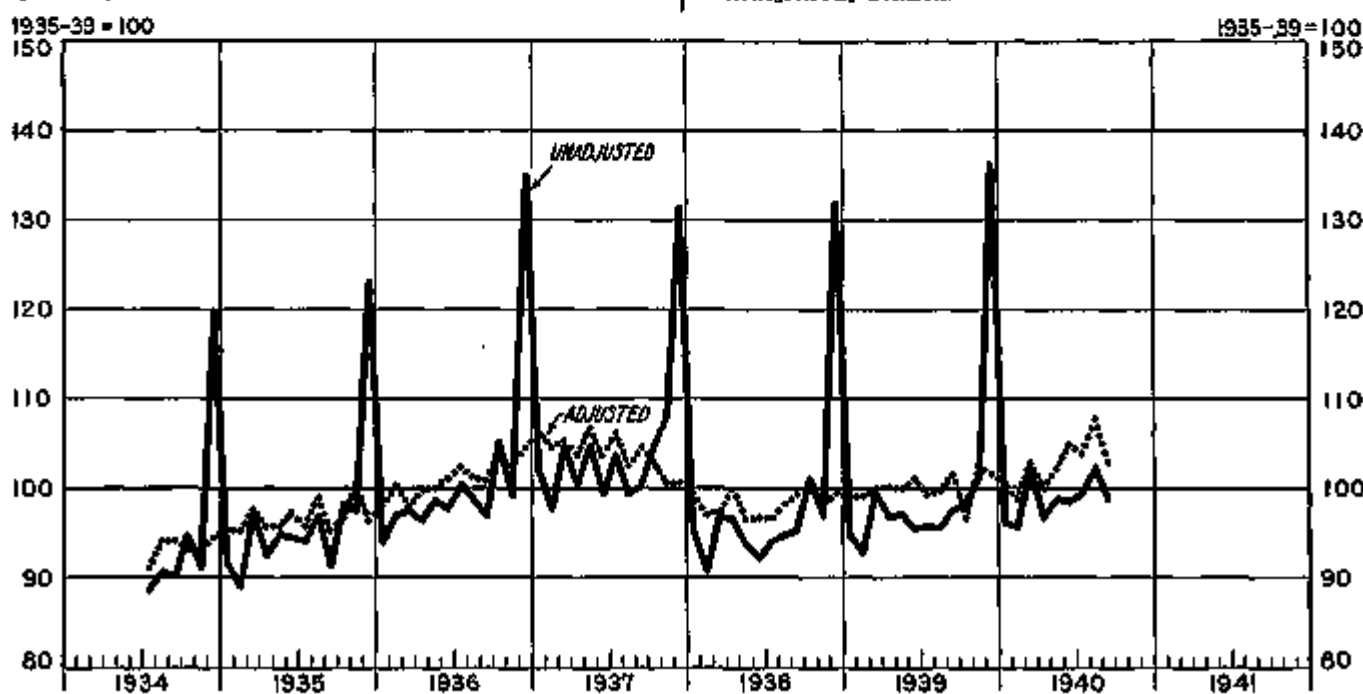[1] Average for July-December.

1935-39 = 100

Figure 6.—Index of Chain Drug Store Sales, 1934-40 (U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce).